shown by the fact that they sometimes occur apart from any connection with the young ascocarps. Moreover, the development of asci proceeds in a region remote from the "trichogynes." The ascogonial hyphae are differentiated in the basal part of the mass of interwoven hyphae; they are characterized by their larger size and larger nuclei. No nuclear fusions were observed in the ascogonia, which seem to have lost their function and appear soon to degenerate. Apparently the ascogenous hyphae do not arise from them, but from other hyphae near the base of the perithecium, which appear after the ascogonia disintegrate. The asci arise from the terminal part of the ascogenous hyphae without the hook-formation common in ascomycetes. Other cells of the ascogenous hyphae may also grow out into asci. The ascus cells contain two nuclei which fuse as usual, whereupon three successive divisions occur, forming the eight spore-nuclei. The first of the three divisions is regarded as a reduction division, to counterbalance the single fusion which was observed. After the spore membrane has been formed, the nucleus of each spore divides again, a septum dividing the spore into two unequal cells being formed between the daughter nuclei.—H. HASSELBRING.

Insect galls.—The past few years have demonstrated an increasing interest in the study of cecidology, and, as in all biological subjects, the first work is taxonomic. A few of the interesting papers of the past few months are as follows: PEREZ[23] discusses the cecidia of *Eritrea*, describing 36 species of galls and one gall-maker. The descriptions are clear and the technical names of the host plants are given, but there are no figures. The VAN LEEUWEN-REIJNVAANS[24] discuss the cecidia of Java, describing 150 species on almost as many host plants. Most of these galls were collected at Salatiga at an elevation of about 600 meters; and they were found to be much more abundant in the moist than in the dry localities. Descriptions are given of the galls, and in many cases of the insects also, but the authors state that in describing the gall it is not necessary to describe the gall-maker, a view which is contrary to the views of some of our American entomologists, but with which the reviewer is in hearty sympathy. Most of the descriptions are accompanied by good figures. TROTTER[25] gives descriptions of 19 species of galls occurring on 14 host plants. His descriptions also include the bibliographies of those previously described. HOWARD[26] has described 52 species of Dr. SICHELS' collection, which is deposited in the Entomological Museum of Natural History in Paris. He also mentions a number of old galls of unknown origin. MASSALONGO[27]

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[23] PEREZ, T. DE STEFANI, Altri Zoocecidii dell' *Eritrea*. Marcellia **8**:7–18. 1909.

[24] LEEUWEN-REIJNVAAN, J. und W., DOCTORS, Einige Gallen aus Java. *Op. cit.* **8**:21–35, 85–122. 1909; **9**:37–61. 1910.

[25] TROTTER, A. Nuovi Zoocecidii della Flora Italiana. *Op. cit.* **8**:50–59. 1909.

[26] HOWARD, C., Les collections cécidologiques du Laboratoire d'Entomologie du Museum d'Histoire Naturelle de Paris: L'Herbier du Dr. SICHEL. *Op. cit.* 65–78.

[27] MASSALONGO, C., Galle e simili produzioni anormali. *Op. cit.* 133–141.

gives descriptions, with bibliography and in some cases figures, of 15 species. PANTANELLI[28] gives a lengthy description of a mite (*Eriophyes*) of the olive and also a description of its gall. RUBSAAMEN,[29] continuing his studies on the European cecidia, describes, and in many cases figures, 42 species, 4 of which are new. BAYER[30] in a paper on the cecidia of Bohemia gives a bibliography of 32 titles and lists 198 cecidia.

For a number of years the anatomy or rather the histology of cecidia has proved an interesting field for the European workers, but only in recent years has it attracted the attention of the American students. A recent paper is that of GREVILLIUS[31] on the anatomy of the thysanopterous cecidia of *Vicia Cracca*. This gall is very conspicuous because of the curling and twisting of the leaves which are infested with the insects, whose eggs can be found between the epidermis and mesophyll. In the more advanced stages the palisade cells lose their characteristic forms and become isodiametric. These galls never develop the complicated structures found in those produced by the hymenopterous insects.

Although the physiological problems connected with the study of insect galls have long been looked upon with interest, the difficulties have been so great that few have had the courage to attack them. One of the recent papers on this subject is by NALEPA,[32] who has taken up a study of the gall-inhabiting ants. This subject has been investigated by others, among them PEYRITSCH, who considered light the most important factor because there were more galls on plants growing under shade than in the light. NALEPA's work took into consideration the relative importance of light, temperature, and moisture, and involved a number of experiments in which the insects were kept in cylinders, in which these factors could be controlled. In this connection he studied also other insects, such as *Eriophyes*, which he found were uninfluenced by the light. His results in general confirm the views of PEYRITSCH.—MEL T. COOK.

Transpiration.—RENNER[33] has published a paper on the physics of transpiration. It adds a number of important facts to the epoch-making work of BROWN and ESCOMBE on multiperforate septa. He works out mathematical formulae for the resistance to the passage of water vapor offered by stomatal apparatus of various xerophytes. The experimental part is carried out with models having the shape of xerophytic transpiratory canals and with plants

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[28] PANTANELLI, E., Un Eriofide nuovo sull' olivo. *Op. cit.* 142–146.

[29] RUBSAAMEN, EU. H., Beiträge zur Kenntnis aussereuropäischer Zoocecidien. *l.c.* **9**:3–36. 1910.

[30] BAYER, EMILE, Les Zoocécidies de la Bohème. *Op. cit.* 63–104.

[31] GREVILLIUS, A. Y., Ein Thysanopterocecidium auf *Vicia Cracca* L. *Op. cit.* **8**:37–45. 1909.

[32] NALEPA, A., Der Heliotropismus der Gallmilben und seine biologische Bedeutung. *Op. cit.* 78–84.

[33] RENNER, O., Beiträge zur Physik der Transpiration. Flora **100**:451–547. 1910.